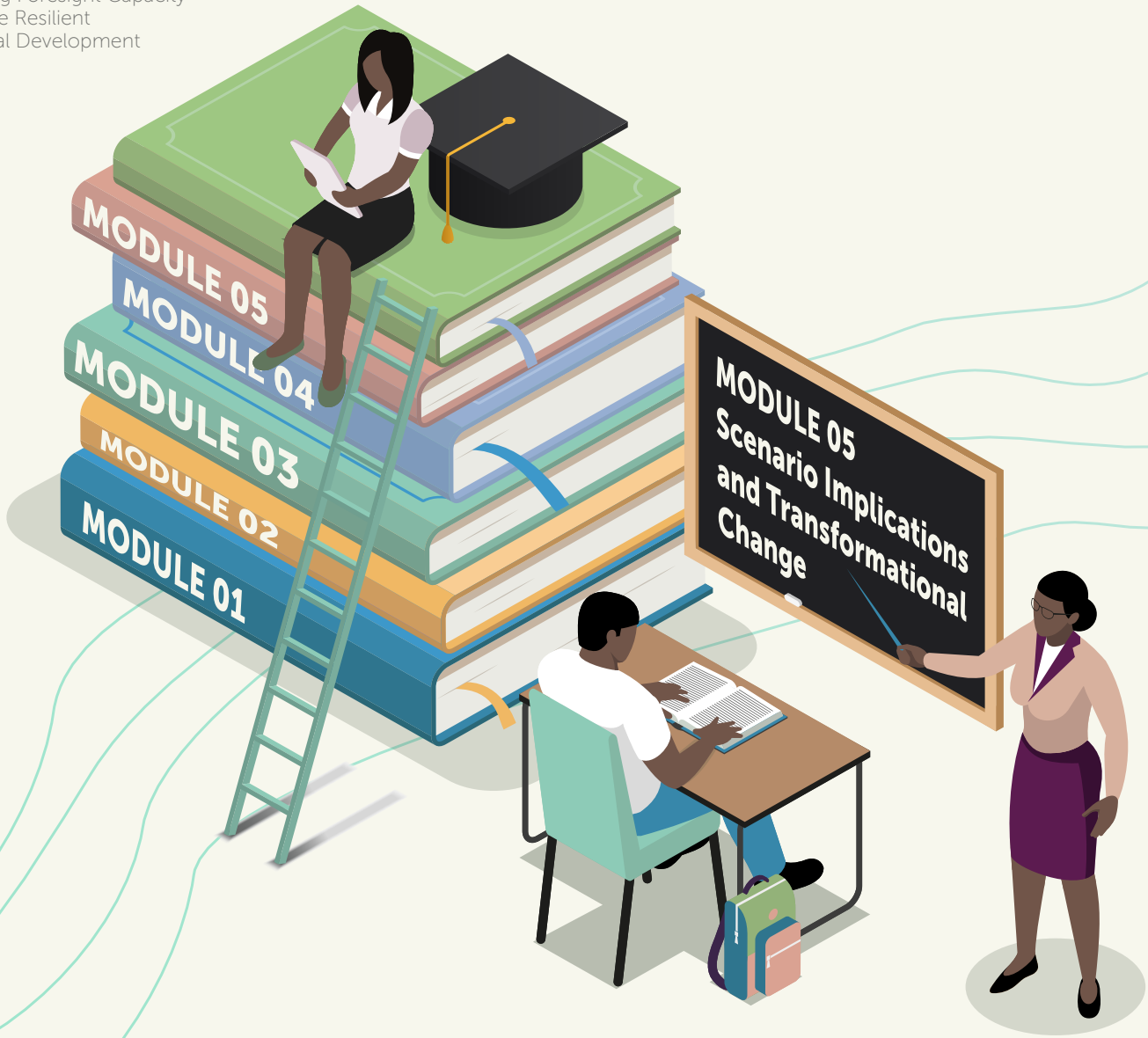
SADC Futures

Developing Foresight Capacity for Climate Resilient Agricultural Development



MODULE 05
Scenario Implications and Transformational Change

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security
CCAFS
ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE
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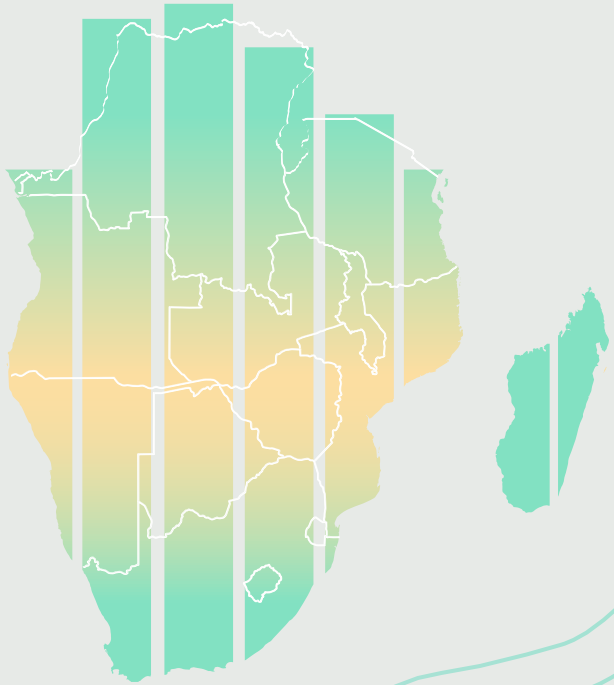
CCARDESA Centre for Coordination of Agricultural Research and Development for Southern Africa



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SADC FUTURES FORESIGHT TRAINING TOOLKIT

The SADC Futures project (https://bit.ly/SADCFuturesForesight) has developed a range of foresight training materials. The SADC Futures Foresight Training Toolkit forms part of this knowledge series and presents content that was given during the SADC Futures webinar series, a six-part virtual webinar series and facilitated training.

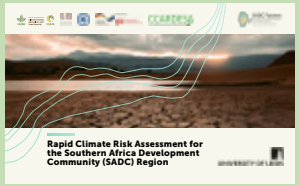
INPUT

Structures, Policies and Stakeholder Landscape Relevant to Climate Change and Agriculture in the SADC Region

ANALYSIS

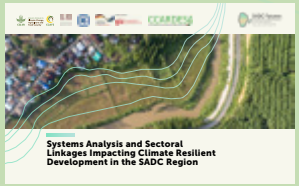
Historical Analysis of Climate Change and Agriculture Related Events in SADC

Mega-trends in the Southern African Region



Rapid Climate Risk Assessment for the Southern Africa Development Community (SADC) Region

INTERPRETATION



Systems Analysis and Sectoral Linkages Impacting Climate Resilient Development in the SADC Region

PLAN

Climate Resilient Development Pathways

PROSPECTION

What Are Scenarios Telling Us About Developing Climate-Resilient Pathways in the Southern African Region?

REFLECTION

STRATEGY

Applying Foresight For Enhanced Climate Resilience and Agriculture Policy Development in the SADC Region

SADC Futures Foresight Training Toolkit

The purpose of the toolkit is to provide accessible training to multiple stakeholders on key foresight methods and how and when to apply them.

SADC Futures Foresight Framework

A tailored foresight training framework was created for the project, as a foresight exercise typically includes several methods and tools. The framework brings together the key stages of foresight, with methods and approaches that are relevant to the application for climate resilient agricultural development. This theme was chosen as **climate change poses the greatest threat to the SADC region's agricultural system and therefore technical capacity is needed to address these future impacts and adapt plans, policies, and programs**.

The foresight framework **guides users in the practical application of the chosen foresight tools and methods for innovative strategic planning and policy formulation for climate resilience**. It is important to note that there is no standardised way of doing foresight, the methods and tools presented in the framework were chosen specifically for the theme of climate-resilient agricultural development in the SADC region.

The foresight framework has been built around seven stages that address key questions.

Data, evidence, knowledge and creativity

Stakeholder engagement and participation

INPUT

Context

- Scope
- Theme or key topic
- Geopolitical boundary
- Structures & policies
- Timeline
- Stakeholder Mapping

ANALYSIS

What is happening?

- Trend Analysis
- Horizon Scanning
- Evidence

INTERPRETATION

Why is it happening?

- Systems Mapping
- Cross sectoral and multi-stakeholder approaches

PLAN

What do we want to experience in the future? What might get in our way?

What might we do to get there?

- Visioning
- Causal Analysis
- Stakeholder Analysis
- Backcasting
- Pathway Development & Trade-offs

PROSPECTION

What might happen that we have not thought about?

- Developing Scenarios
- Identify drivers and critical uncertainties
- Develop plausible future scenarios

REFLECTION

What might we want to do differently?

- Scenario Implications
- Transformation Elements
- Transformational Change

STRATEGY

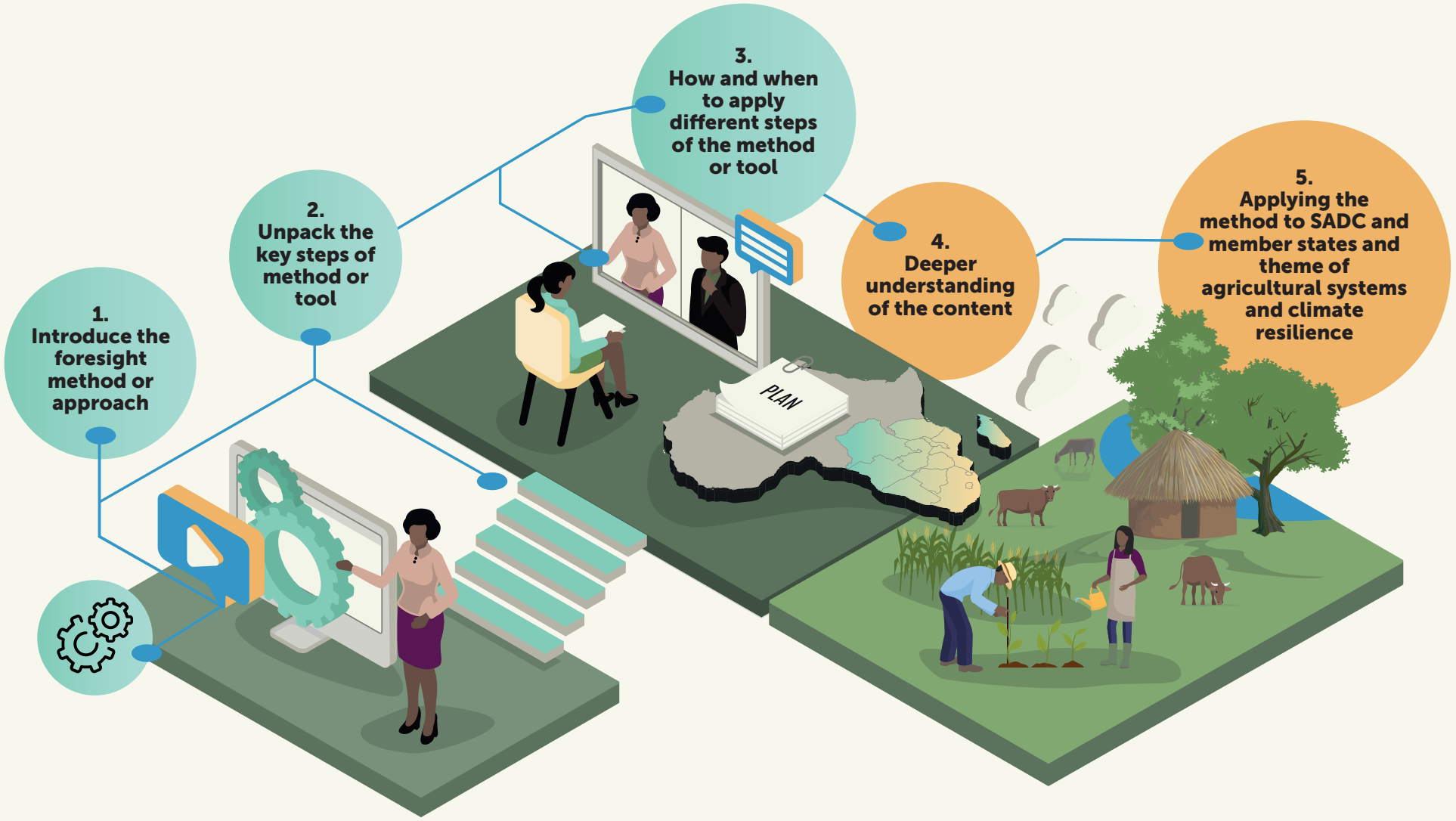
What will we do differently?

- Transforming Climate Resilient Pathways

SADC Futures
Developing Foresight Capacity for Climate Resilient Agricultural Development

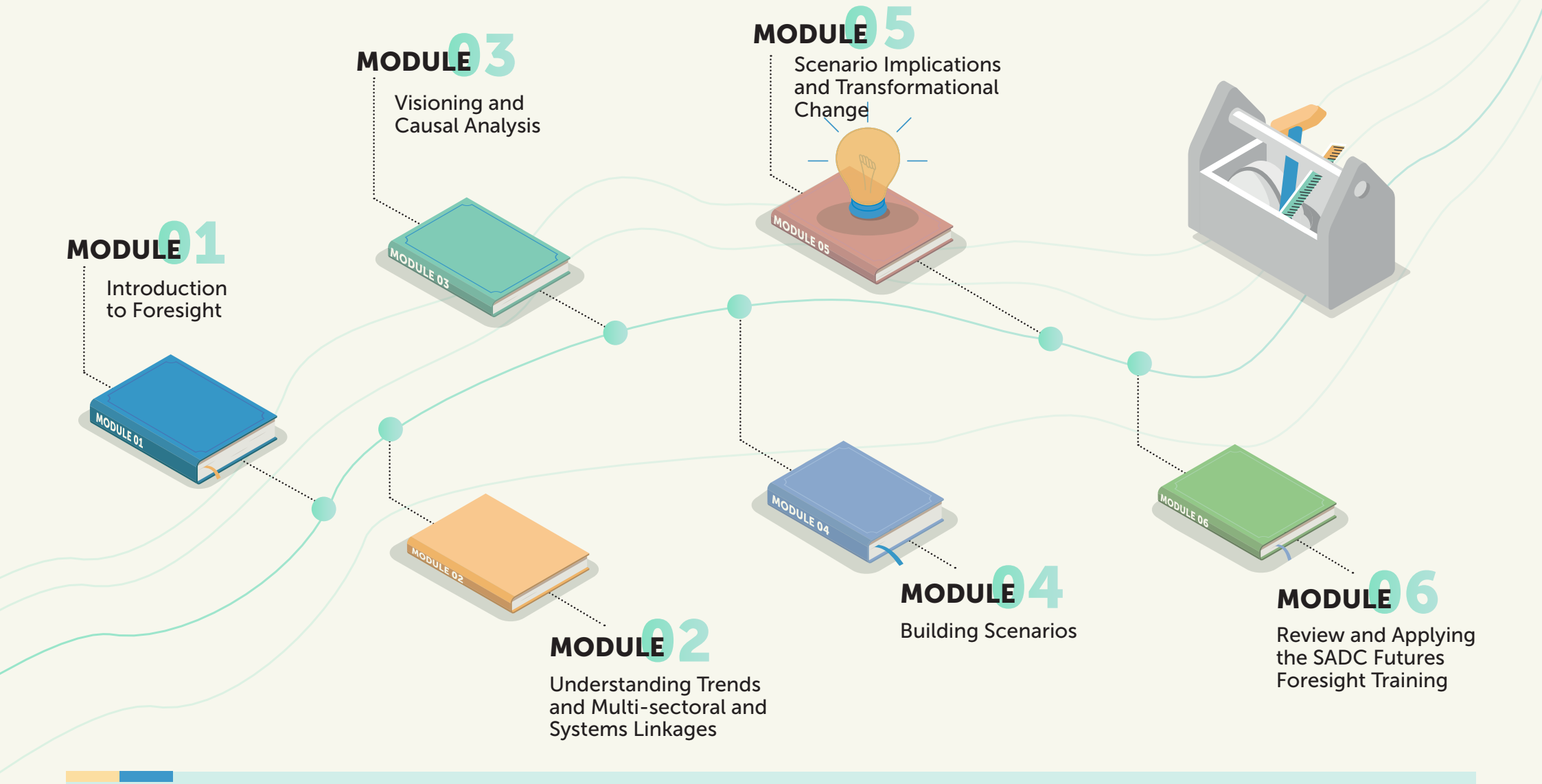
Training approach

The training approach used starts by introducing the foresight method or tool and the key steps to follow in using it. An explanation of how and when to apply the different key steps is provided. The application of the method or tool is then demonstrated in the context of climate-resilient agriculture development in the SADC region.



Structure of the toolkit

The toolkit comprises six modules. **This document presents Module 5: Scenario Implications and Transformational Change.**



Within the modules, reference is made to the SADC Futures knowledge series supplementary reports (as previously shown mapped to the foresight framework). These reports provide further detail on the use of the foresight methods and tools for building climate-resilient agricultural development in the SADC region.

How to use the toolkit

Exercises, learning reflections and key questions are provided throughout the toolkit modules to equip users to practically apply the range of foresight tools and methods. They are indicated by a variety of icons as illustrated below.

'Test Your Learning' exercises are provided at the start of each module. These exercises test the user's knowledge of the SADC Futures Foresight Training Framework. The exercises are based on information learnt in the preceding modules and provide a refresher for the user before progressing with the next module.

Learning Exercises are included throughout the toolkit modules to provide step-by-step guidance on how to apply the different foresight methods and tools. These exercises are demonstrated in the context of climate resilient agri-food systems in the SADC region.

Further practical exercises are provided to assist the user in applying foresight in the context of their chosen theme as they progress through the training. The materials produced by the user during the exercises are built upon in a sequential manner along the foresight framework.

Learning reflections are provided at the end of each foresight method. These allow the user to reflect on what they have learnt before moving on to the next method.

To guide the thought process of the user **key questions** and answers are highlighted throughout the manual.

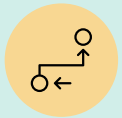
Questions and Answers from participants of the SADC Futures webinar series

'Questions and Answers' are scattered throughout the toolkit to provide an added learning experience. These questions were put forward by participants of the SADC Futures webinar series. The answers to the questions were provided by specialists in the respective fields in question.

Glossary of Key Terms[i]

Foresight

Term	Description
Backcasting	The process of working backwards from the definition of a possible future to determine what needs to happen to make the future unfold and connect to the present.
Barrier	Identified obstacle that could stop the achievement of an activity.
Black Swan	An event that could absolutely not be predicted.
Brainstorming	A method of obtaining ideas without judgement or filtering. It involves encouraging wild and unconstrained suggestions and listing ideas as they emerge.
Causality	A logical link between events, where a cause precedes an effect and altering the cause alters the effect.
Complexity	Complex systems are non-linear and diverse networks made up of multiple interconnected elements. Cause and effect relationships within the system are not easily discernible or predictable. Historical extrapolation is not possible for predicting emergence (new patterns and behaviours) in complex systems.

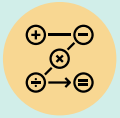
Term	Description
Critical Uncertainties	Are drivers that are both highly impactful and highly uncertain.
Cross-cutting Issues	Issues or challenges that affect more than a single interest area, institution, or stakeholder, and that need to be addressed from all points of view.
Drivers	Are factors, issues or trends that cause change thereby affecting or shaping the future.
Driving Force 	A cluster of individual trends on the same general subject moving trends in certain directions, they are broad in scope and long term in nature (for example, climate change or globalisation).
Evidence	The integration of raw data constituting numbers, words, images, and insights emerging from diverse knowledge sources.
External Driver	External force of change, for example political or market drivers.

Term	Description
Feasible	Possible and practical.
Forecast	An estimate or best guess of what might happen in the future i.e. not a definitive prediction.
Foresight	Structured tools, methods and thinking styles to enable the capacity to consider multiple futures and plan for them.
Foresight Organising Group	A small core group that builds the foresight plan
Foresight Participating Group	A broad mix of identified key stakeholders that need to be involved
Futuring	The act, art, or science of identifying and evaluating possible future events.

Term	Description
Grey Rhino	These are the large, obvious dangers that will sooner or later emerge but whose exact timing is unknown.
Impact	Refers to the potential scale of impact of a driver on a scenario theme.
Internal Driver	Internal force of change for example, social drivers within a farm or community directing the decision making of a farmer.
Mega-trend	A trend that is apparent at a large or global scale e.g. growing youth population across the African continent.
Mind Mapping	Allows a group's ideas to be charted in logical groupings fairly quickly, even when ideas are given in a non-sequential manner. This technique allows efficient brainstorming for ideas and at the same time creates a skeletal framework for later categorisation of the information generated.
Modelling and Simulation	The process of creating and experimenting with a computerised mathematical model imitating the behaviour of a real-world process or system over time. Simulation is used to describe and analyse the behaviour of a system when asking 'what-if' questions about the real system and aid in the design of real systems.

Term	Description
Not Predictive	Participatory with multiple viewpoints, bringing in quantitative and qualitative evidence but not predictive.
Pathway	A trajectory in time, reflecting a sequence of actions and consequences against a background of separate developments, leading to a specific future situation.
Plausible	It is reasonable to assume the scenario could happen. Plausibility does not mean that a future situation will happen.
Predictability	The degree of confidence in a forecasting system based either on law derived from observations and experience, or on scientific reasoning and structural modelling.
Projecting	A quantitative technique that can be used in the analysis phase of the foresight process. Projecting or time series analysis are used when several years of data are available, and trends are both clear and relatively stable.
Projection	An expected value of one or more indicators at particular points in the future, based on the understanding of selected initial conditions and drivers.
Resilience	A system's ability to cope with and recover from shocks or disruptions, either by returning to the status quo or by transforming itself to adapt to the new reality.

Term	Description
Scenarios	Are storylines/narratives, answering 'what if' questions that describe multiple alternative futures spanning a key set of critical uncertainties. Scenarios identify future drivers of change and then plot out plausible directions that they may take.
Scenario Development	An approach to understanding highly impactful and highly uncertain drivers and to describe possible future states. Although they address uncertainty, scenarios are not predictions or forecasts - they are not 'true' or correct/ wrong - only plausible.
Social Network Mapping	A tool to identify the importance and influence of stakeholders as well as how they exchange information or are connected.
Time Frame	The complete period (past-to-future) considered in a foresight exercise.
Transformation	An agriculture and food systems transformation is a significant redistribution - by at least a third - of land, labour and capital, and/ or outputs, and outcomes (e.g. types and amounts of production and consumption of goods and services) within a time frame of a decade.
Trend	A general tendency or direction of a movement or change over time e.g. increasing erratic seasonal rainfall patterns.

Term	Description
Trend Impact Analysis	Collecting information and attempting to spot a pattern, or trend, and assess its influence from the information.
Uncertainty	Refers to how much or how clear we are on how a driver will emerge or play out in the future. High uncertainty does not mean 'high improbability', high uncertainty can mean having little knowledge of how something may pan out.
Underlying Cause	Unpacking why an obstacle is in place.
Unknown Unknowns	Issues and situations in organisations that have yet to surface and which are blind spots for planners who are unaware that they do not know about them.
Viable	Able to be done or could occur.
Vision 	A compelling image of a (usually preferred) future.

Term	Description
Visioning	A well-known prospective technique with a highly participatory approach.
Wicked Problem	A problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognise.
Wild Card	A low-probability but high-impact event that seems too incredible or unlikely to happen.

Climate Resilience

Adaptive Capacity	The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.
Climate Change	Climate change is a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer.
Climate Resilience	The ability of a system to 'bounce back' from the impacts of climate-related stresses or shocks. It is the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.

Term	Description
Exposure	Refers to the inventory of elements in an area in which hazard events may occur.
Hazard	A possible, future occurrence of natural or human induced physical events that may have adverse effects on vulnerable and exposed elements.
Risk	Intersection of hazards, exposure, and vulnerability.
Sensitivity	The degree to which a system is affected, either adversely or beneficially, by climate variability or change.
Social Vulnerability	Inability of people, organisations, and societies to withstand adverse impacts from multiple stressors to which they are exposed.
Vulnerability	The propensity or predisposition of a system to be adversely affected by an event. Vulnerability is a function of a system's sensitivity, and its adaptive capacity.

Agricultural Systems

Term	Description
Agriculture	Is the science, art, or practice of cultivating soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products.
Agricultural Value Chain	Includes the people and activities that bring a basic agricultural product such as maize to the consumer. The activities include obtaining inputs and production in the field right through to storage, processing, packaging, and distribution.
Biological Diversity	The variability among living organisms from all sources, including terrestrial, marine, and aquatic ecosystems.
Cross Sectoral Coordination	The engagement, management, planning and implementation, of activities conducted across different thematic sectors to deliver development outcomes (e.g. food security, nutrition, sustainable landscapes, and agriculture).
Ecosystem Services	These include provisioning services, such as the production of food (e.g. fruit for humans or grazing for cattle) and water; regulating, such as the control of flooding and disease; supporting, such as nutrient cycles and oxygen production; and cultural, such as spiritual and recreational benefits.

Term	Description
Elements	The different, discrete elements within a system (e.g. farms, organisations, inputs, and soil).
Interconnections	The relationships that connect the elements (e.g. rules, ideas, funding, or service relationships, among others).
Land Degradation	A process in which the value of the biophysical environment is affected by a combination of human land-use activities. It is viewed as any change or disturbance to the land perceived to be undesirable.
Multi-Stakeholder Collaboration	Consists of a mix of representatives or stakeholders from public, civil, and private domains of society.
Post-Harvest Loss	Is the loss in quantity and quality of agricultural produce between harvest and consumption. It includes on-farm losses e.g. damage to grain by pests, as well as losses along the value chain during transportation, storage, and processing.
Pre-production	This stage of the agricultural process is prior to production and may involve land preparation and the sourcing and purchasing of inputs such as seed and fertiliser.

Term	Description
Productive Inputs	These are used to increase yields and range from improved seeds, genetics, fertilisers and crop protection chemicals to machinery, irrigation technology and knowledge.
System	An interconnected set of elements that is coherently organised in a way that achieves something (function and purpose). For example, the purpose of an agricultural system could be to produce dairy products and the system could consist of interconnected elements such as the farmer, employees, cattle, machinery, feed, water, and energy.
Systems Thinking	A mindset, tool, and process that is reserved for complex problems.
Systems View	Understands life as networks of relationships.
Transboundary Animal Disease	Epidemic disease which is highly contagious or transmissible and has the potential for very rapid spread, irrespective of national borders, causing serious socio-economic and potentially public health consequences.

[i]Definitions for the glossary were obtained from several information sources (listed below) as well as from specialists in the respective fields.

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Photo: Felix Clay, Duckrabbit 2012

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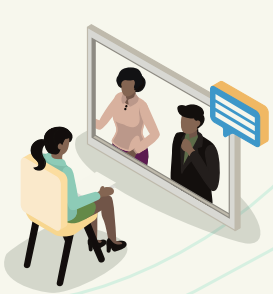
What Will You Learn?

Module 5 focuses on the reflection and strategy stages of the foresight process. It starts with a revision of developing scenario storylines, a method learnt in Module 4. It then covers the method used to reflect upon scenario storylines, to understand the implications they may have on achieving a vision and what actions or activities could be implemented to avoid the negative storylines and get us to that preferred future. Transformational change is then defined and how it can be achieved through enhancing pathway actions and activities to make them transformative. The last section of the module demonstrates the application of this method to a pathway action plan to achieve transformational change.

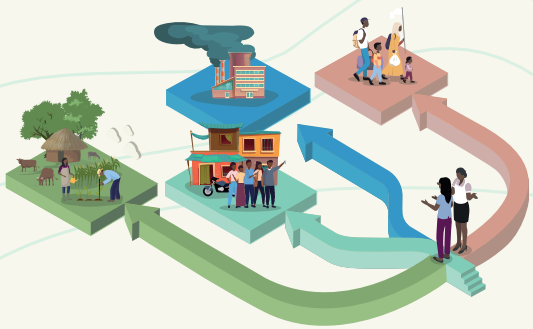
On completing Module 5 you will:

- **Understand how to build scenario storylines;**
- **Be able to review scenario implications and brainstorm initial actions to address potential future states;**
- **Understand transformation and transformational elements; and**
- **Be able to apply transformation to existing or future pathways or strategies to ensure they are robust.**



Reflection - Reviewing Storylines

Scenario Implications



Scenario Outcomes

Transformative Actions

Strategy - Transformative Pathways

Test Your Learning of the SADC Futures Foresight Framework

Before continuing with Module 5, test your understanding of building scenarios based on information given in Module 4, by answering the questions below:

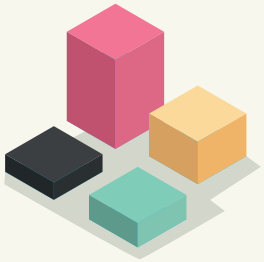
What are the seven key steps to building scenarios?

Key steps for building scenario storylines

1. Define focal issue and relevant time frame

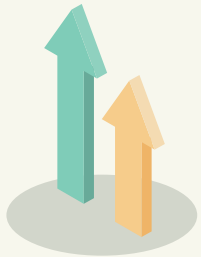
2. Identify and brainstorm drivers of change

3. Group drivers into categories

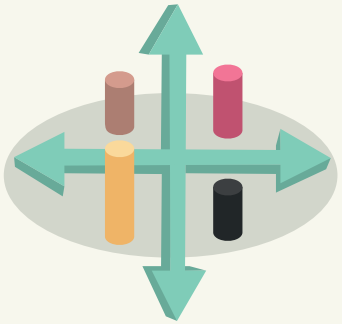


4. Identify high impact & high uncertainty drivers

5. Select high impact & high uncertainty drivers



6. Set up scenario axis



7. Build scenario storylines

In a scenario process, what are the key factors that cause change that we are trying to understand?

Socio-cultural

Agriculture Productivity

Natural Resources and Environment

Economic

Governance/ Political/ Institutional

Drivers - are factors, issues or trends that cause change thereby affecting or shaping the future.

Internal driver - internal force of change for example social drivers within a farm or community and directing decision making of a farmer.

External driver - external force of change, for example political or market drivers.

Driving forces - a cluster of individual trends on the same general subject moving in certain directions, broad in scope and long term in nature e.g. climate change or globalisation.

For a scenario exercise you want to select drivers that are... and ....?

Reflection Stage

The reflection stage of the foresight process follows on from the prospection stage described in Module 4. In this stage it is important to understand the implications of scenarios and to consider elements that allow for transformational change. A key question the scenario method aims to answer is:

What might we want to do differently?

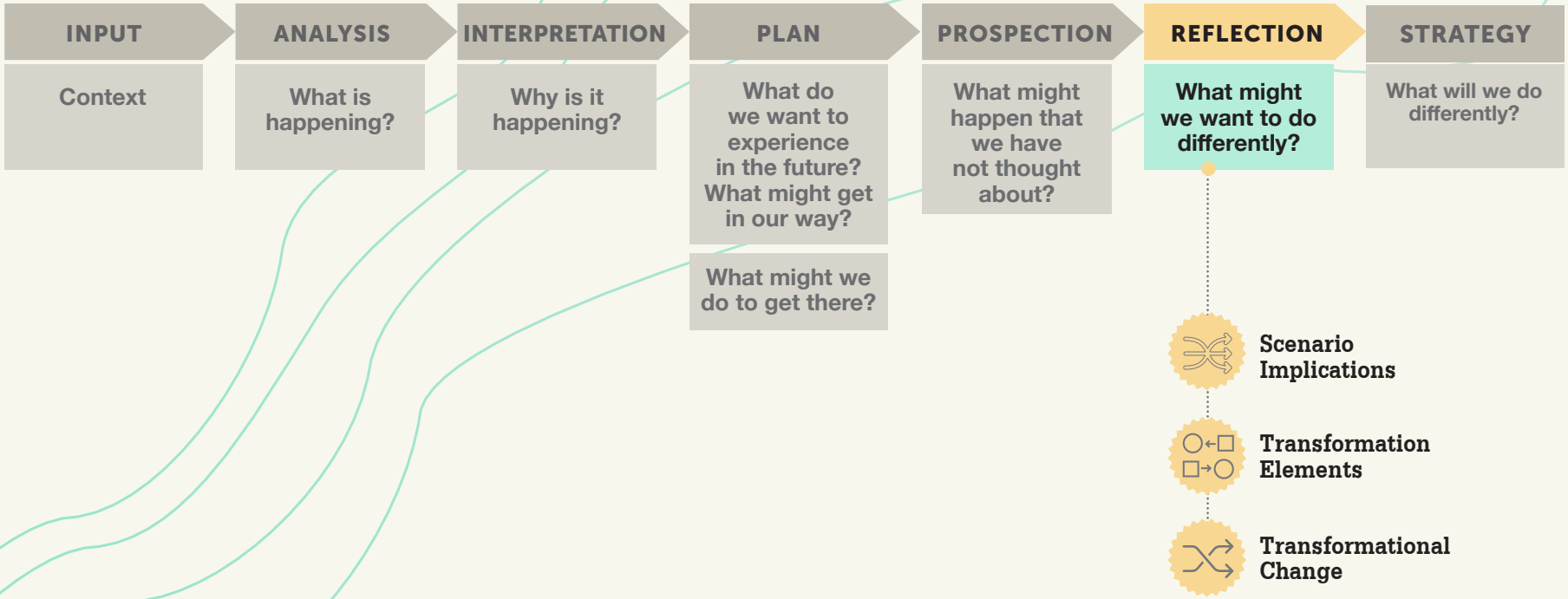


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Photo: Mokhamad Edliadi (CIFOR)

Scenario Implications

Scenario implications falls under the reflection stage of the foresight framework. This method is applied after the scenario storylines have been developed.

What is the method?

- Once scenarios have been developed, this method is used to reflect upon and explore what has emerged in the scenario storylines that might have implications on achieving a vision.
- This method can be used to test existing pathways and strategies to understand what would have to change, given the future narratives that have emerged from the scenarios.

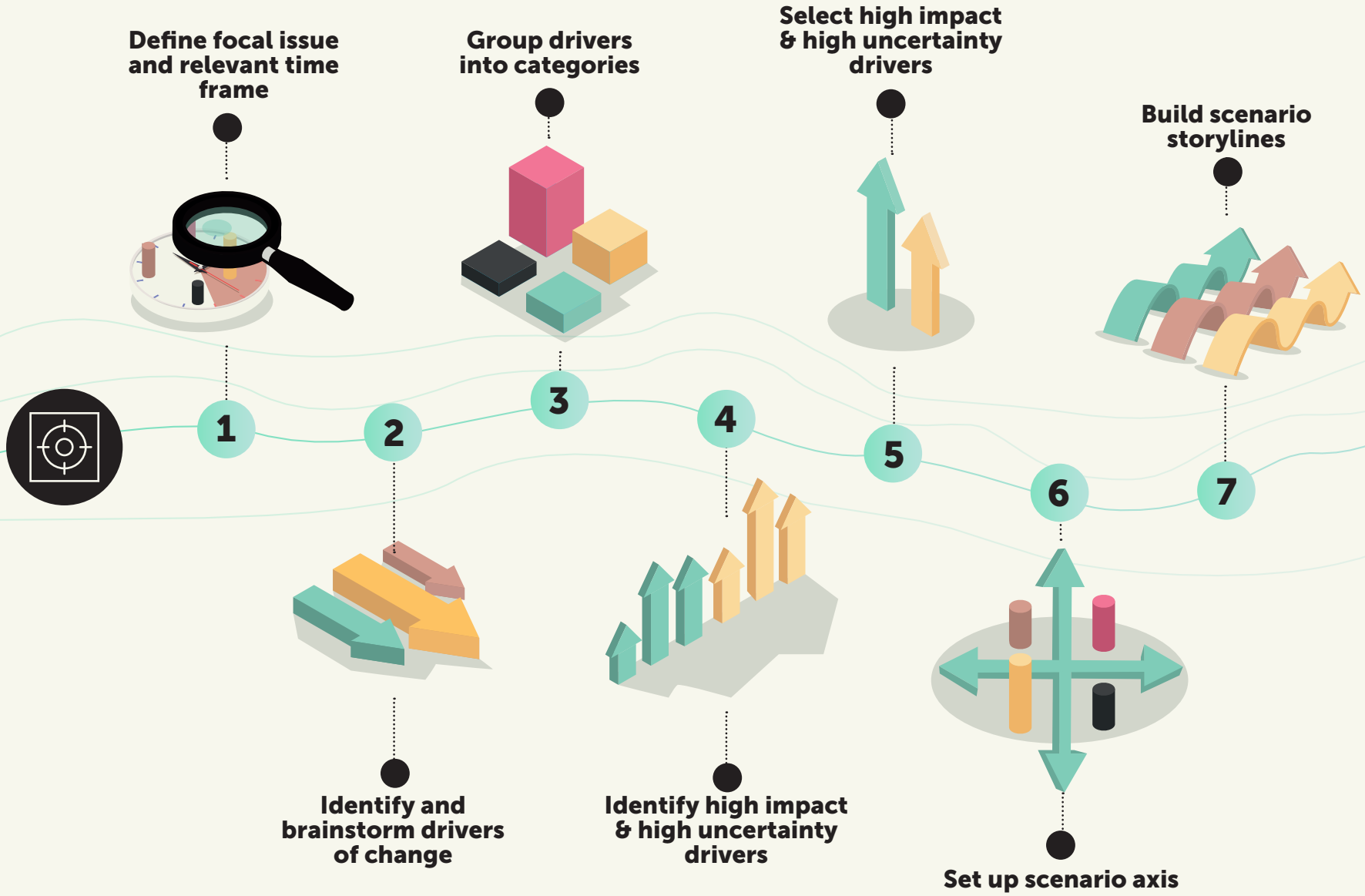
Why apply it?

- Given what we have learnt from different scenarios, it is important to reflect on the many storylines to discover what it means for how we can go about.

A key thing to remember is that scenarios are not about predicting the future, the storylines are not what will happen but what could happen, among a range of things that could happen under different future scenarios. Their importance is in making sure policy considers a range of possible futures and makes decisions that consider that the future is not certain. We want to make decisions now that enable us to respond to different futures as they come. Scenarios are a means to explore the 'possibility space' in the future, we are looking for actions that are reasonably robust across these different futures.

This section provides a brief recap on the 'developing scenarios' method as it forms the basis for the application of the scenario implications and transformational change methods covered in this module.

Scenario steps



Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

Here we **revisit the scenario building exercise** undertaken in Module 4, the scenario examples provided are relevant to the context of climate resilient agri-food systems in the SADC region.

Scenario Building

Once the focal issue you wish to address and the time frame have been defined, relevant drivers are identified and ranked based on two criteria: the magnitude of 'impact' on the dimension of the focal issue, and the degree of 'uncertainty'.

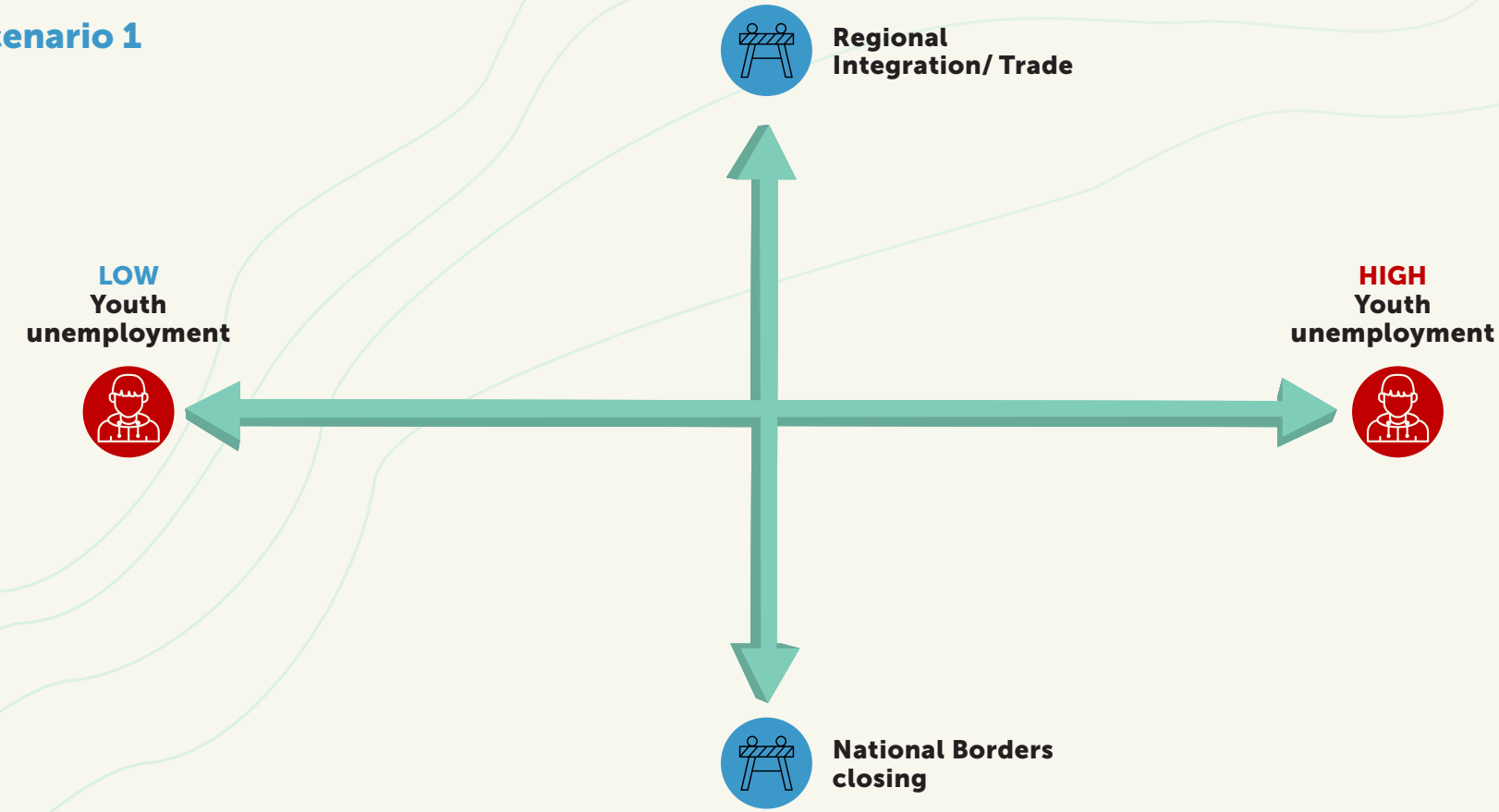
Questions & Answers

Do the drivers always have to be linked?

No, the drivers do not have to be linked. Once you have selected your high impact and high uncertainty drivers it can be valuable to allocate them to axes in random combinations as this can present scenarios that would not have been thought of previously. Furthermore, it is important to put as many different driver combinations together as possible, to be able to consider a variety of viable or plausible futures. For example, in considering the COVID-19 pandemic, if multiple scenarios had been run with public health drivers could it have allowed us to see a pandemic as a plausible event?

High impact and high uncertainty drivers are then selected as they are the drivers that we know the least about and that could have the biggest impacts. They are allocated as axes with their extremes defined.

Scenario 1



Next, the dimensions **considered to be relevant to the focal issue** are described. Those chosen as relevant to climate resilient agri-food systems are:

Socio-cultural education, gender, and youth

Economic investment and trade

Environmental ecosystem functioning, forest cover, and soil health

Political and Institutional

Agriculture Productivity livestock, crops, and aquaculture

These dimensions are then placed within the axes to prevent the accidental omittance of a category.

Once the high impact and high uncertainty drivers are allocated to axes and the dimensions are laid out within them, we can start to **unpack the scenarios by looking at each quadrant in turn**. Each of the quadrants reflects how two of the drivers meet. For example, consider Scenario 1 below:

Scenario 1

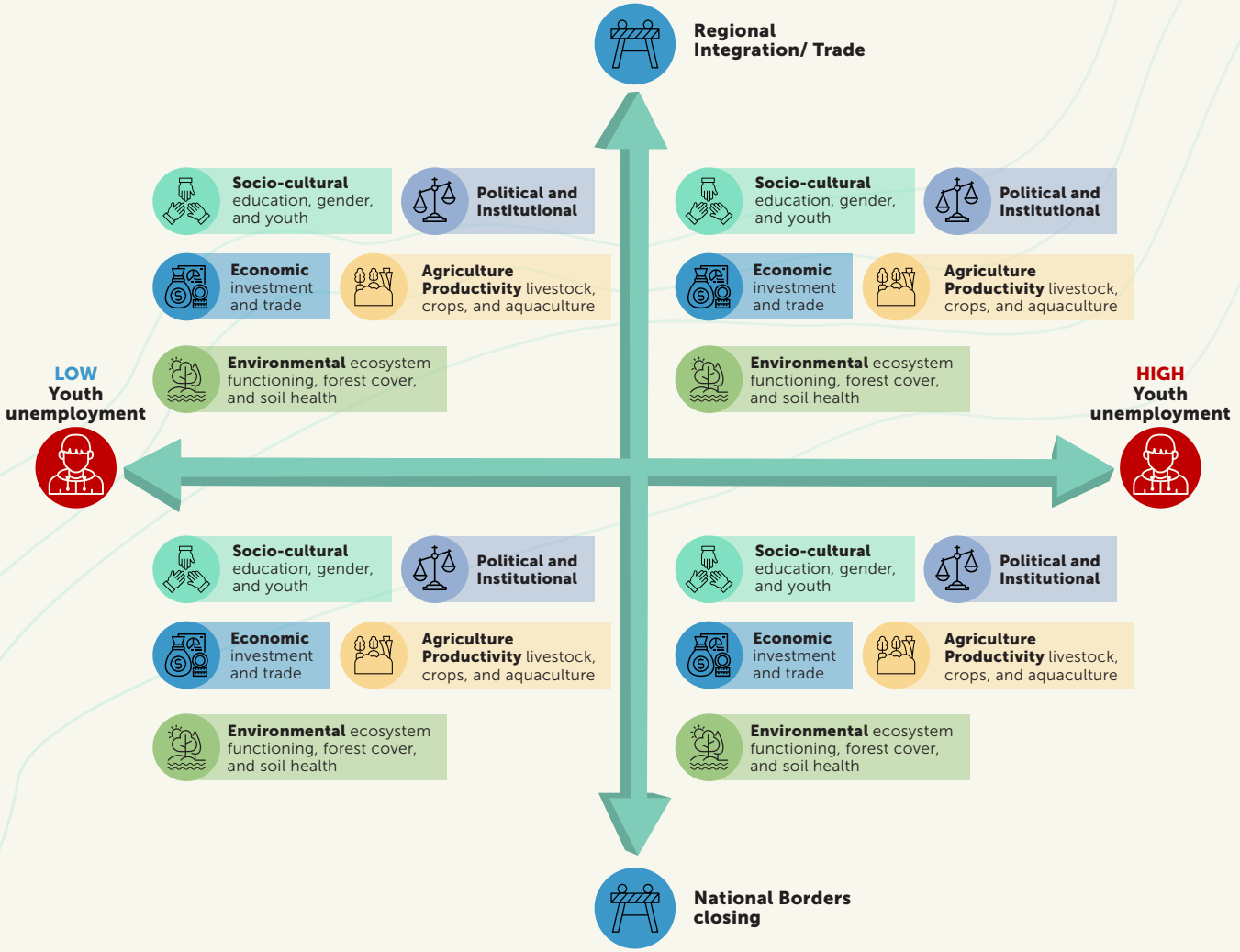
The high impact, high uncertainty drivers chosen for the axes are:

- National border closing to regional integration; and
- Low youth unemployment to high youth unemployment.

The socio-cultural, economic, environmental, political and institutional, and agricultural productivity dimensions are then laid out within the axes.

To build the scenario storylines we then consider each dimension within a quadrant individually. For example, in Module 4 we considered the economy dimension within the high youth unemployment and low regional integration quadrant, answering the following question:

What might the economy look in the future under this scenario?

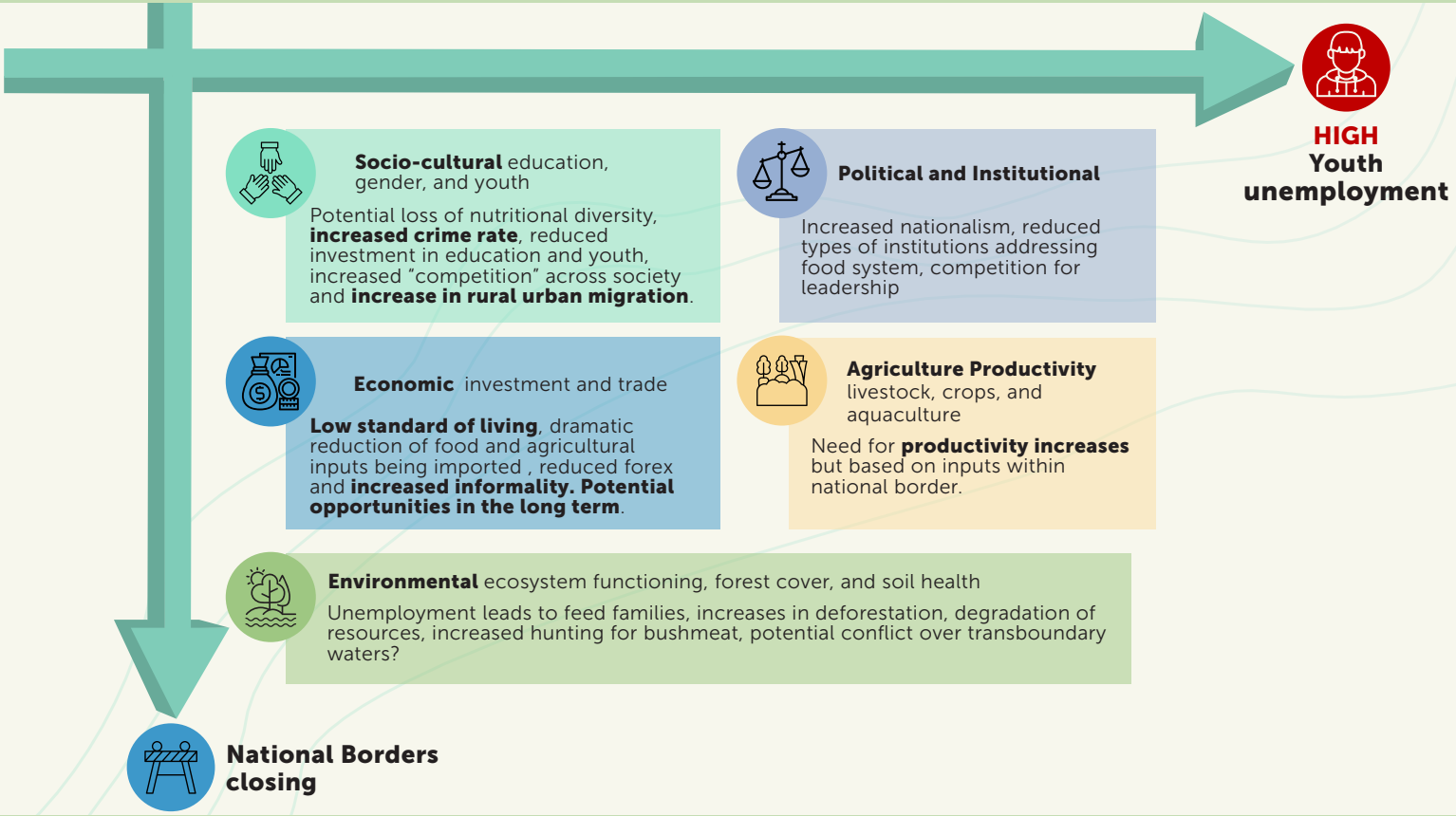


Some examples of storylines (from participants of the SADC Futures webinar series) on the state of the economy, taking into consideration the quadrant indicating high youth unemployment and low regional integration, are provided below:

'Increased crime rate.' 'Increase in rural-urban migration.' 'Low standard of living.' 'Increased informality.' 'Potential opportunities in the long term.'

The next quadrant to consider has the following axes:

- Low youth unemployment; and
- High regional integration.



What might agricultural productivity look in the future under this scenario?

For example, participants of the SADC Futures webinar series gave the following storylines on agricultural productivity, taking into consideration the quadrant indicating low youth unemployment and high regional integration:

'Increased youth participation in agricultural value chains.' 'Productive, mechanised agriculture with low labour intake.' 'Increased access to agricultural markets.' 'Increased well-being.' 'Land locked countries will be better off.' 'Political stability.'

Socio-cultural education, gender, and youth

Governments have increased national budgets but may or may not focus resources on improved social safety nets, education and empowerment. Higher employment rates allow for greater spending power. **Increase in well being**.

Economic investment and trade

SADC support to cross country results in effective trade, investments infrastructure, investments in short and long value chains. **Increased access to agricultural markets**. High employment rates influence national and international income, industry growth. Available resources inspire entrepreneurship, greater use of technology. **Land locked countries will be better off**.

Political and Institutional

Member countries are focused on economic development, poverty alleviation and peace and security. **Political stability**.

Agriculture Productivity livestock, crops, and aquaculture

Increased youth participation in agriculture value chains. Productive, mechanized agriculture with low labour intake. Pastoralists, small-scale farmers and fishers may be marginalized in favor of large-scale production systems. Integrated farming systems are not promoted.

Environmental ecosystem functioning, forest cover, and soil health

Desire for short term benefits leads to status quo for land management and potential for land and forest degradation.

National Borders closing

HIGH Youth unemployment

Questions & Answers

The different combinations for linking drivers and the depths to which we can explore them seems endless, how can we focus and prioritise them?

Limit the options you need to assess by applying your scope i.e. focal issue and timeframe. The dimensions you choose are critical. Think broadly within your scope but focus on the dimensions that are important to the preferred outcome.

Scenario Implication Actions

Now that you have refreshed your memory on developing scenario storylines, the next step is to **consider their implications and designate appropriate actions and activities to achieve the preferred future or avoid negative storylines**.

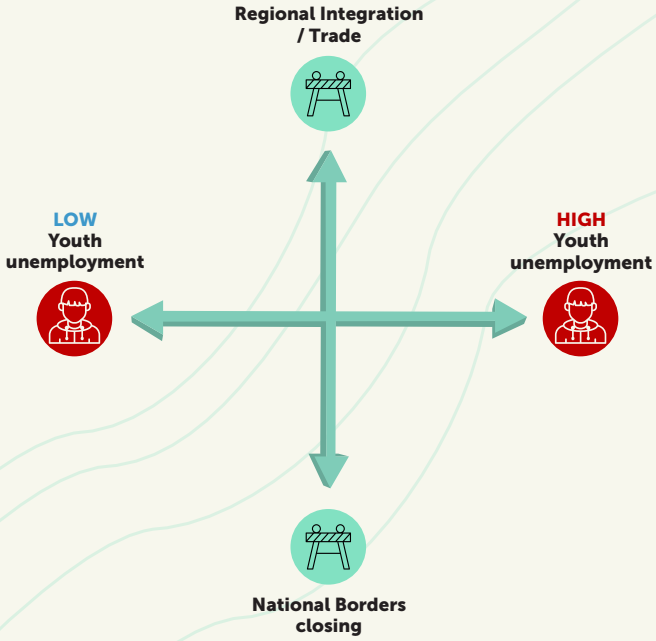
Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

For example, consider Scenario 1:

Scenario 1

- National border closing to regional integration; and
- Low youth unemployment to high youth unemployment.

Look across all the scenario storylines that have been developed throughout this matrix and determine the actions that need to be taken to increase the likelihood of reaching the preferred future or avoiding the negative storylines. For example, the following actions could be considered:



- Increase agricultural diversity, productivity, integrated systems
- Create green jobs for youth
- Build synergies and coordination across government sectors and stakeholders
- Focus on vocational education
- Create policies to support/subsidize integrated farming
- Enhance production / nutrient flows across the country

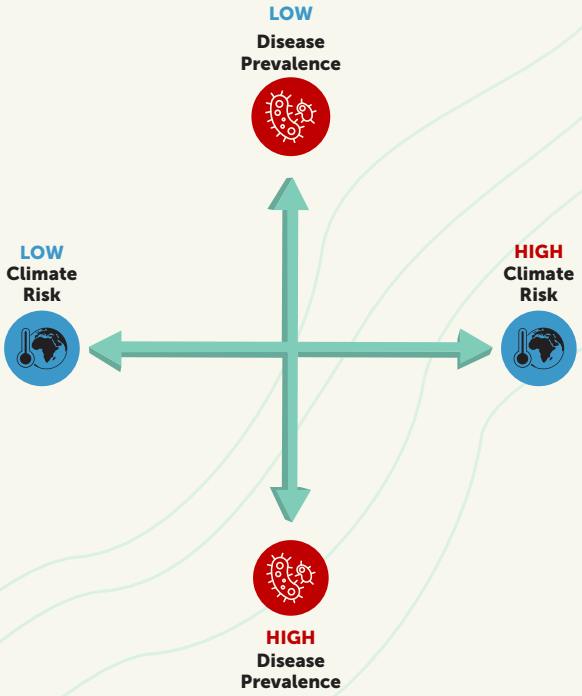
Now determine the scenario implication actions for Scenario 2:

Scenario 2

- Low climate risk to high climate risk; and
- Low disease prevalence/spread to high disease prevalence/spread.

Look across all the scenario storylines in all the quadrants that have been developed and ask yourself:

What actions would I need to take to increase the likelihood of reaching the preferred future, or to avoid the negative storylines?



- Invest in climate proof infrastructure
- Increase social safety nets
- Investment in resilient, shock responsive food systems
- Enhanced linkages via digital networks
- Operational local and national savings to respond to emergencies
- Promote digital agricultural solutions (farmers on line for digital platforms)
- Soft skills for decision makers
- Mobile money infrastructure
- Disaster and disease preparedness in terms of resources, supplies, safety nets/mutual aid

Learning Exercise

In this exercise you will develop scenario storylines and propose ideas for actions to achieve the preferred future, or to avoid the negative storylines. This exercise is best conducted in a meeting or workshop setting with a variety of actors with different backgrounds to provide multiple, diverse viewpoints for discussion.

Task 1 - Consider the tables below which represent quadrants of a scenario matrix, two drivers and five dimensions are provided for each. Develop a scenario storyline for each dimension in the quadrant.

Task 2 - Enter ideas into the given table for actions you could take based on what your storyline is showing.

An action or activity- is something that helps us achieve the positive storylines or avoid the negative storylines.

DRIVERS: HIGH CLIMATE RISK + LOW EMIGRATION		
Dimensions	**Task 1 - Storyline**	**Task 2 - Action / Activity**
ECONOMIC, INVESTMENT AND TRADE		
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION		
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH		
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE		
POLITICAL / INSTITUTIONAL		

DRIVERS: HIGH YOUTH UNEMPLOYMENT + LOW DISEASE PREVALENCE		
Dimensions	**Task 1 - Storyline**	**Task 2 - Action / Activity**
ECONOMIC, INVESTMENT AND TRADE		
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION		
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH		
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE		
POLITICAL / INSTITUTIONAL		

This exercise was also completed by participants of the SADC Futures webinar series. See their ideas in the tables below. How do your ideas compare? Did they develop storylines or actions that you did not think of? This demonstrates the importance of engaging multiple stakeholders from a variety of backgrounds.

DRIVERS: HIGH CLIMATE RISK + LOW EMIGRATION		
Dimensions	**Task 1 - Storyline**	**Task 2 - Action / Activity**
ECONOMIC, INVESTMENT AND TRADE	• Higher reliance on trade in Southern Africa; • Poor economic conditions; • Low investment appeal; and • Investment in tourism.	• Improve regional market integration. • Textile industry with the brand 'Made in Lesotho' becomes a global trademark. • Identify products that are well suited - goats / mohair / and export crafts. • Support economic transition towards an industrial/service-based economy. • Come to an arrangement with South Africa on opening railway lines to one of the ports.
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION	• Have to shift to alternative livelihoods due to land issues with livestock.	• Revisioning campaign on comparative advantage livelihoods i.e. away from livestock. • Addressing patriarchal norms and values which create power imbalances and heightened vulnerability of women.
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH	• Water is a key consideration; • Land degradation; and • Overstocking and overgrazing due to a growing population and dependence on livestock.	• Dam and irrigation considerations. • Soil conservation measures. • Rainfall is harvested for water exports supplying South Africa and other countries.
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE	• Reliance on agriculture for employment. • High disease infestation on livestock.	• Breeding programmes using artificial insemination and promoting aquaculture. • Use of disease tolerant crops. • Hydroponics to protect against climate change impacts. • Use technology and practices that are climate smart.
POLITICAL / INSTITUTIONAL	• More stringent regulations on environmental protection due to climate risks. • Support to resilience.	• Restructure the national budget towards climate risk activities.

DRIVERS: HIGH YOUTH UNEMPLOYMENT + LOW DISEASE PREVALENCE		
Dimensions	**Task 1 - Storyline**	**Task 2 - Action / Activity**
ECONOMIC, INVESTMENT AND TRADE	• Youth can be trained/educated (without fear of disease) and then employed (more certainty that they will not be affected negatively by disease).	• Enabling training, more accessible to the youth. • Enabling access to finance. • Training should be available in local languages. • Implementing what is on paper to allow youth to access funds. • Youth involvement.
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION	• Youth are motivated and looking actively for opportunities. • Youth are creating opportunities for themselves, higher entrepreneurship.	• Creation of associations to involve youth. • Improving living conditions in rural areas with things like electricity, to allow for internet connections.
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH	• Unemployed youth could be used to take care of the environment and improve the ecosystem, through tree planting and thereby improving soil health. • Increase land care awareness groups, promoting environmental stewardship.	• Government actions to attract youth to stay in the rural areas. • Programme to help youth take ownership of the environment.
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE	• Opportunity to diversify production and adopt climate smart practices. • Production of more climate resilient crops, rabbit farming, conservation farming, growing of legumes to fix nitrogen. • Horticulture production and improvement in agricultural productivity.	• Government to help in the creation of cooperatives to attract youth into agriculture. • Encouragement or promotion of ICT in agriculture to attract youth. • Building of vibrant youth groups. • Promotion of agriculture as a mainstream job, not a backup plan or a lesser desired activity.
POLITICAL / INSTITUTIONAL	• Vote of the youth will be important. • High youth unemployment may lead to exploitation of the youth by politicians. • Youth need to be engaged as current and future leaders.	• Inclusive policies to encourage participation of youth in politics. • Implementation of youth programmes and tracking.

Questions & Answers

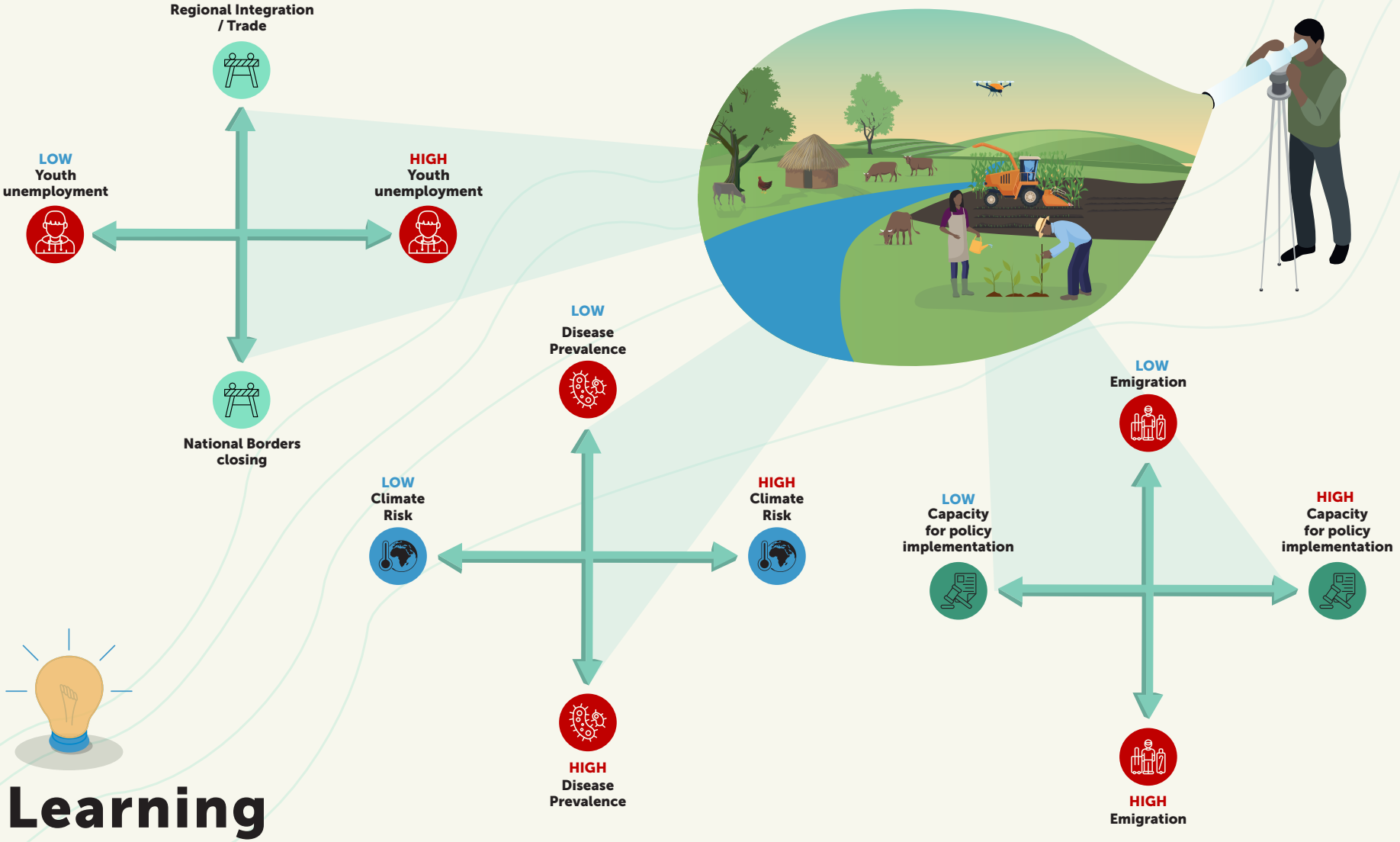
How do you verify your storylines?

Combining qualitative and quantitative inputs can enhance the robustness and consistency of scenarios. For example, you could use a participatory scenario development approach at first, these often include opinions about human values and behaviour. Then apply a more focused quantitative approach to verify the storylines by looking at data and using computer models.

The above question **'how do you verify your storylines?'** was put forwards in the SADC Futures webinar series, the answers that were given demonstrate the importance of multi-stakeholder collaboration for knowledge sharing and the importance of diverse viewpoints and dialogue.

- 'The participatory scenario process, involving multiple stakeholders, is useful in avoiding bias.'
- 'The issue of benchmarking is especially important because in each country there are scientists investigating climate change. The politicians (some of which are scientists) have political agendas. It is the duties of the scientists to correct false information or misperceptions.'
- 'If scenario projects are run across multiple countries in the region, the outputs can be verified.'
- 'In the case of climate change, we need to work collectively to see results. If we do not it could be considered maladaptation.'
- 'In theory it is good to run shared projects and implement actions collectively, however not all the countries in the region are at the same level of development. It is important not to slow down those that are ahead and leave behind others that are lagging. We need to try to grow collectively, to harmonise growth. Furthermore, different countries have different priorities.'
- 'It is important to recognise the starting point, this determines the length of the journey. Those that take longer will have precedents to learn from. Leaders must work independently and the initiative must be long term. Addressing climate change in the region would be considered more of a programme than a project.'

The above question **'how do you verify your storylines?'** was put forwards in the SADC Futures webinar series, the answers that were given demonstrate the importance of multi-stakeholder collaboration for knowledge sharing and the importance of diverse viewpoints and dialogue.



Learning

You should now understand how to review scenario implications and brainstorm initial actions to address potential future states.

Transformational Elements and Change

Transformational elements and change still falls within the reflection stage of the foresight framework[1]. This is where we think about what our actions need to be to adequately respond to the different possible futures identified during the scenario development process.

Transformation can be defined as:

- Physical or qualitative changes in form, structure, function or meaning. Changing from one type of system to another with a different identity. It can refer to the biophysical world or the social world. It can be intentional, autonomous, or forced (O'Connell et al., 2015).
- The process of changing the current system (O'Connell et al., 2015).
- A change in the fundamental attributes of natural and human systems (Denton et al., 2014).
- (In the context of agri-food systems) a significant redistribution, by at least a third, of land, labour and capital, and/ or outputs and outcomes (e.g. types and amounts of production and consumption of goods and services) within a timeframe of a decade (Steiner et al., 2020).

When you hear the term transformation what do you think of, or how do you define this?

Participants from the SADC Futures webinar series gave the following responses, how does your understanding of transformation compare?

'Change of status or way of existence.'

'Change from the current way things are done.'

'It's a complete change.'

'Permanent change from the current to desired state.'

'A marked change.'

'Change of the current situation.'

'Is the change after going over a tipping point, it may not be to a better state.'

[1] Guidance on Transformational Change was received from Laura Pereira under the scenario work conducted for the Programme for Climate-Smart-Livestock-Systems (PCSL) at International Livestock Research Institute https://www.ilri.org/programme-for-climate-smart-livestock-systems.

Transformative scenario planning is a promising tool for improved decision making by taking four issues into account (Ranjan, 2019)

- Dealing with assumptions through developing detailed and carefully contextualised understandings;
- Recognising uncertainties by mapping causal relationships of important variables;
- Widening perspectives through combining a variety of ideas from diverse disciplines; and
- Resolving dilemmas and conflicts by considering a wide range of stakeholders' views.

Multi-stakeholder engagement is critical to transformative scenario planning. The active involvement of civil society, policy-makers, science communities, and businesspeople is needed in creating a cohesive vision, framing problems jointly, generating solutions-oriented knowledge, creating mass awareness, experimenting with solutions, developing networks of mutual learning, and leveraging collective action for implementation (Ranjan, 2019).

What is the method?

- We apply transformational 'elements' which can be grouped broadly under policies, interventions and partnerships and are a grouping that come together to result in significant 'transformative' change.

Why apply it?

- Transformative change includes major long-term changes in the way we operate and may shift us between, or into, a new 'system' and process. This can be a significant or radical level of change.

Some useful ways of thinking about transformation include:

- The future that is coming often requires significant change;
- Transformative change sometimes requires radically new interventions, policies, and partnerships; and
- It moves us beyond incremental change, and results in major long-term changes in the way systems operate.

Transformations are complex processes that require significant planning and foresight to pursue effectively. Transformations often require significantly more change than most expect and consist of major, long-term changes in the way systems operate. We often build our plans and strategies based on actions that result in incremental change, when we need actions that are transformative and suitable for the future that is coming. In Module 4, we looked at climate-resilient pathways that follow a process and end in an outcome. The pathways developed, as with many plans and strategies, are unlikely to result in transformative change. A key question here is:

How can these plans and strategies be improved to achieve transformational change?

Agroecological climate smart processes
Develop a climate smart, ecosystem based strategy.

Markets for small grains
Awareness campaign on the benefits of small grains.

Digital extension
Develop linked radio and mobile phone communications for distance extension service remote communities.

Scope & Timeline
Outcome
Stakeholders
Suggested Actions
Existing Assets
Barriers & Causes
Pathway Action Plan

- What
- Who
- By when
- How
- Output
- Associated outcome
- Overall outcome

Outcome
Enabling environment that promotes a policy incentive and implementation path for ecosystem-based approaches in farming systems.

Outcome
Increased demand for producing, processing, marketing and consuming small grains.

Outcome
Functioning distance extension services to support farmers in applying climate smart practices.

Photos: TOP | © Alex Fassio (CFOR) MIDDLE | ©S.Kilungu (CCAFS)

Transformative Actions

To achieve transformational change, consider the use of the following three transformative

- **Interventions** - integrated and adaptive interventions;
- **Policies** - flexible, robust, and synergistic policies that drive implementation; and
- **Partnerships** - novel partnerships, cross sectoral or multi-stakeholder relationships.

Categories of transformative actions

Integrated and adaptive interventions

Flexible, robust and synergistic policies that drive implementation

Novel partnerships, cross sectoral or multi-stakeholder relationships

Interventions

Examples of integrated and adaptive interventions include:

- A monitoring, reporting, and verification system;
- New design or infrastructure;
- Scaling existing innovations;
- Awareness, knowledge, skills, empowerment development;
- Knowledge or data platforms;
- New technology;
- A lifestyle or behaviour change;
- Finance/incentives/subsidies; and
- New businesses and business models.

Taking an example of an intervention from above, a transformative action may be - **developing financial technology to enable the private sector to directly pay farmers for restoring land health**.

Policies

Examples of flexible, robust, and synergistic policies that drive implementation include:

- Changes in decision making processes;
- A form of decentralisation or distributed decision making;
- Nested scale policy design;
- Time bound reflections on policies; and
- Cross sectoral policy development and financing frameworks.

Using the example of 'changes in decision making processes' a transformative action could be - **to develop a formalised office in financial planning for cross sectoral coordination, joint planning, and joint budgetary allocations**.

Partnerships

Examples of novel partnerships, cross-sectoral or multi-stakeholder relationships include:

- New set of actors working together in an informal or formal setting;
- New cross sectoral, multi-stakeholder relationships;
- Pooling resources, money, or labour for synergy; and
- Trans-generational and thematic partnerships.

Using the example of 'pooling resources, money, or labour for synergy', a relevant transformative action could be - **to develop a job hub to bring youth and the private sector together**.

Learning Exercise

Thinking of your personal work or situation, where do you think transformational change is needed? Use the responses from participants of the SADC Futures webinar series below to guide your thought process.

- 'Creating 'new farmers' by engaging educated youth in agriculture.'
- 'Infrastructure and education relating to the use of information technology. The limiting factor is probably education.'
- 'Traditional policies and the mindset of people need to change.'
- 'I think most African countries have great policy frameworks, but they remain great on paper and not action oriented.'
- 'Smallholder farmer policy and practice in knowledge and information sharing on appropriate climate adaptation options.'
- 'Gender and power relations.'
- 'Strengthen and create an improved seed value chain.'
- 'The Greenbelt initiative could facilitate tree belts as buffers followed by artificial wetlands as sponges for water for agricultural lands year-round.'
- 'Improved land tenure systems in smallholder communities.'
- 'Resource allocation to farmers and the provision of bank loans at low interest.'

Learning Exercise

Looking at the actions you described in the tables of the previous learning exercise, how would you transform them using the transformative elements you have just learnt about:

Interventions **Policies** **Partnerships**

How would you transform your actions, or which new activity or action might be needed?

DRIVERS: HIGH CLIMATE RISK + LOW EMIGRATION		
Dimensions	**Action / Activity**	**Transformation**
ECONOMIC, INVESTMENT AND TRADE		
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION		
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH		
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE		
POLITICAL / INSTITUTIONAL		

DRIVERS: HIGH YOUTH UNEMPLOYMENT + LOW DISEASE PREVALENCE		
Dimensions	**Action / Activity**	**Transformation**
ECONOMIC, INVESTMENT AND TRADE		
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION		
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH		
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE		
POLITICAL / INSTITUTIONAL		

This exercise was also completed by participants of the SADC Futures webinar series. See their ideas for transforming their previously defined actions in the tables below. Again, reflect on how your ideas compare. Would you consider implementing some of the transformative actions they proposed?

DRIVERS: HIGH CLIMATE RISK + LOW EMIGRATION (Participants defined Lesotho as their geopolitical boundary)		
Dimensions	**Action / Activity**	**Transformation**
ECONOMIC, INVESTMENT AND TRADE	• Improve regional market integration • Textile industry with the brand 'Made in Lesotho' becomes a global trademark • Identify products that are well suited - goats / mohair / and export crafts. • Support economic transition towards an industrial/ service-based economy. • Come to an arrangement with South Africa on opening railway lines to one of the ports.	• Limits on imports, giving preference to local manufacturing. • Putting a ban on certain exports.
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION	• Revisioning campaign on comparative advantage livelihoods i.e. away from livestock. • Addressing patriarchal norms and values which create power imbalances and heightened vulnerability of women.	• Partnerships – inclusive of both genders, LGBT communities, departments for social welfare support and education.
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH	• Dam and irrigation considerations. • Soil conservation measures. • Rainfall is harvested for water exports supplying South Africa and other countries.	• Transboundary water management agreement. • Ensuring not using oil-based plastic for bottling. • Innovative technologies for groundwater. • Introduction of environmental levies - to curb further degradation. • Integrated water association and user committees. • Pastoral representation in political spheres.
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE	• Breeding programmes using artificial insemination and promoting aquaculture. • Use of disease tolerant crops. • Hydroponics to protect against climate change impacts. • Use technology and practices that are climate smart.	• Green subsidies as an incentive
POLITICAL / INSTITUTIONAL	• Restructure the national budget towards climate risk activities.	

DRIVERS: HIGH YOUTH UNEMPLOYMENT + LOW DISEASE PREVALENCE		
Dimensions	**Action / Activity**	**Transformation**
ECONOMIC, INVESTMENT AND TRADE	• Enabling training, more accessible to the youth. • Enabling access to finance. • Training should be available in local languages. • Implementing what is on paper to allow youth to access funds. • Youth involvement.	• Change in accessibility of loans and finance. • Improvement of ICT infrastructure to improve trade and investment. • Promotion of village banking and table banking.
SOCIO-CULTURAL, GENDER, YOUTH, EDUCATION	• Creation of associations to involve youth. • Improving living conditions in rural areas with things like electricity, to allow for internet connections.	• Transform curricula of the education sector-- move away from agriculture as a punishment to making agriculture something desirable to enter into. • Transformation in gender relations to help women have more control over resources, more equitable sharing of income, more joint decision making. • Raising the status of women and youth to be acknowledged properly.
ENVIRONMENTAL STATE, ECOSYSTEM FUNCTION, FOREST COVER AND SOIL HEALTH	• Government actions to attract youth to stay in the rural areas. • Programme to help youth take ownership of the environment.	• Incentivisation for staying in the rural areas. • Green tax rebates or credits. • Entertainment shows (e.g. game shows and quizzes) for young people to voice support for the environment and incentivise stewardship.
AGRICULTURAL PRODUCTIVITY, LIVESTOCK, CROPS & AQUACULTURE	• Government to help in the creation of cooperatives to attract youth into agriculture. • Encouragement or promotion of ICT in agriculture to attract youth. • Building of vibrant youth groups. • Promotion of agriculture as a mainstream job, not a backup plan or a lesser desired activity.	• Youth opportunities to access loans for agriculture. • Digital repository for sharing of ideas on livestock production, easing access to information. • Transform viewpoints to see agriculture as a business. • Market accessibility for the youth. • Encouragement of ICT integration in farming.
POLITICAL / INSTITUTIONAL	• Inclusive policies to encourage participation of youth in politics. • Implementation of youth programmes and tracking.	• Seat for youth in Parliament

Strategy Stage

The strategy stage of the foresight process follows on from the reflection stage. A key question here is:

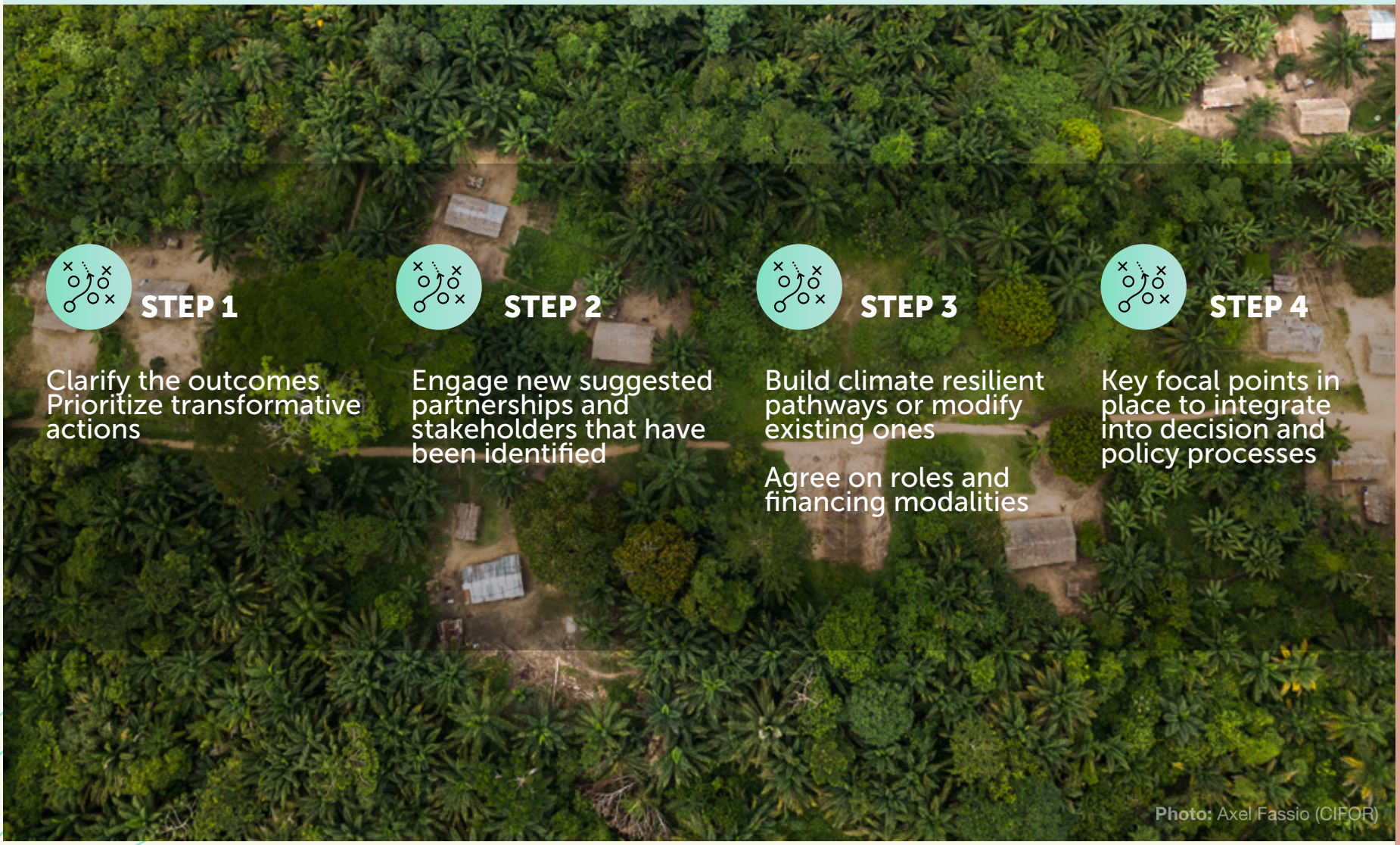
What will we do differently?

In this stage of the foresight process it is important to describe the needed strategies, investments, and solutions that will lead to achieving the transformative goals and targets. This requires understanding which strategies represent incremental/business-as-usual solutions, and which strategies are actually transformative.

INPUT	ANALYSIS	INTERPRETATION	PLAN	PROSPECTION	REFLECTION	STRATEGY
Context	What is happening?	Why is it happening?	What do we want to experience in the future? What might get in our way? What might we do to get there?	What might happen that we have not thought about?	What might we want to do differently?	What will we do differently?

Transforming Climate Resilient Pathways

Often scenario exercises are not practically applied in strategic or policy work and require a dedicated process to ensure the implications are considered. Here we provide **four key steps to transforming pathway action plans**, these can be changed as appropriate to your project. (Refer to the supplementary SADC Futures knowledge series report, 'Climate Resilient Development Pathways' for further information on transforming climate resilient development pathways.



STEP 1

Clarify the outcomes
Prioritize transformative actions

STEP 2

Engage new suggested partnerships and stakeholders that have been identified

STEP 3

Build climate resilient pathways or modify existing ones

Agree on roles and financing modalities

STEP 4

Key focal points in place to integrate into decision and policy processes

Photo: Axel Fassio (CIFOR)

Application in the Context of Climate Resilient Agri-Food Systems in the SADC Region

Given what we have learnt from the different scenarios, what does this now mean in terms of the pathway action plan?
What would need to be done differently if any of these scenarios became the future?
What might this mean in terms of transformational change?

The dynamic nature of the 'pathway development' approach, such as its ability to be up-scaled or down-scaled to accommodate different geographies, timescales, sectors and sub-systems, and its ability to incorporate various bodies of knowledge (social, economic, political, climate science, cultural, etc.), is part of the reason why the approach is so well suited to the experimental thinking necessary for transformational change.

In the plan stage we worked on a climate resilient pathway that had an outcome of all farming systems being more diversified and moving in the direction of green employment and climate resilience.

Overall Outcome: Small, medium and large-scale farming systems and pastoral systems are diversified and increasing productivity and ecosystem resilience through agro-ecological and climate smart practices and are the basis for climate friendly value chains and green employment opportunities.

Furthermore, in the original pathway we set out some activities such as:

- Awareness campaign on value and benefits of integrated farming systems, sustainable agriculture, and climate resilience;
- Develop capacity materials for agroecological approaches and integrated farming systems; and
- Integrate and expand training into existing farmer groups or farmer field schools.

What

Build capacity and incentivize integrated farming systems using agroecological practices

Who

Government sectors – Agriculture, water, environment, extensions services, NGOs, UN FAO, farmers' groups, women's organizations & youth groups, development partners, investors, media

By when

2028

How

- Awareness campaign on value and benefits of integrated farming systems, sustainable agriculture and climate resilience
- Develop capacity materials for agroecological approaches and integrated farming systems
- Integrate and expand training into existing farmer groups/farmer field schools

Output

20,000 farmers are trained in integrated farming systems

Associated outcome

Farmers including women, men and youth are adopting: agroecological practicing, water harvesting measures, sustainable land management activities, higher diverse systems for farming

Is this pathway action plan iterative or transformative?

- **Iterative** responses to climate change address immediate and anticipated threats based on current practices, management approaches, or technical strategies (Denton et al., 2014).
- **Transformative change** is a fundamental change in a system, its nature, and/or its location that can occur in human institutions, technological and biological systems, and elsewhere. It most often happens in responding to significantly disruptive events or concerns about them (IPCC, 2014).

In this case the change is more iterative than transformative.

MORE ITERATIVE THAN TRANSFORMATIVE

What

Build capacity and incentivize integrated farming systems using agroecological practices

Who

Government sectors – Agriculture, water, environment, extensions services, NGOs, UN FAO, farmers' groups, women's organizations & youth groups, development partners, investors, media

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Farmers including women, men and youth are adopting: agroecological practicing, water harvesting measures, sustainable land management activities, higher diverse systems for farming

Photo: Axel Fassio (CIFOR)

The pathway can be transformed as follows:

What

From: Build capacity and incentivise integrated farming systems using agroecological practices.

To:

- Build linkages among large- and small-scale farmers and use co-learning to develop joint capacity;
- Establish linkages with regenerative, climate smart certification markets to incentivise regenerative practices and whole system thinking; and
- Create youth led transboundary detection protocols and teams.

Who

From: Government sectors (agriculture, water, environment, extension services), nongovernmental organisations (NGOs), UN FAO, farmers' groups, women's organisations, youth groups, development partners, investors, and media.

To:

- **New Partners 1** - Large scale and small-scale farmers and pastoralists partner together with youth and work directly with regenerative farm/pasture to market buyers;
- **New Partners 2** - Global/Regional investors partner with telecommunication companies for direct payments to farmers/pastoralists and with high school graduates to monitor practices; and
- **New Partners 3** - Epidemiologists and extensionists, health providers, and conservancies partner for early detection of disease prevalence.

The pathway can be transformed as follows:

How

From:

- Awareness campaign on value and benefits of integrated farming systems, sustainable agriculture, and climate resilience;
- Develop capacity materials for agroecological approaches and integrated farming systems; and Integrate and expand training into existing farmer groups or farmer field schools.

To:

- Awareness campaign on the value and benefits of integrated, climate smart practices engaging land managers, extension services, and the private sector;
- Expand farmer field schools and farm-to-market hubs for training youth, farmers, and pastoralists to provide co-learning opportunities on practices, early warning systems, and market readiness.

Output

From: 20,000 farmers and pastoralists are trained in integrated farming systems.

To: Farmers and pastoralists have actively scaled co-learning hubs to imbed testing of most effective mode and use these in combination with extension models.

Associated outcome

From: Farmers including women, men and youth are adopting agroecological practices, water harvesting measures, sustainable land management activities, and more diverse systems for farming; and

To: 500,000 farmers and pastoralists are implementing integrated, agroecological/climate smart practices on 1 M hectares and are connected directly to local, regional, and global markets for regenerative products.

When you have decided on the future and some of the transformative actions you could use, revisit the backcasting method and ask yourself:

How did we get here (to the new future state you just defined)?

Reminder of steps to follow when applying the backcasting method:

- Step into 2030 and position yourself in the successfully achieved vision such that the future becomes the present.
- Look back to 2020 and ask, 'what do we remember about how we got to here?'; 'what actions, partnerships, policy changes, etc. did we carry out' to get to the 2030 success?
- Remember how you overcame barriers that needed to be addressed.
- As best possible identify when key activities took place.

In closing, it is important to note that transformative pathways require constant re-evaluation and adjustment and must be flexible enough to respond to unforeseen circumstances and consequences that will require new scenario-building and adaptive planning. They are best created with strong integration from national to local governments, as well as input and engagement from multiple sectors (not only the ministries responsible for climate change and agriculture), including civil society organisations that represent the interests of women, the poor, and other potentially marginalised groups (Carter et al., 2018).

Learning

You should now understand the concept and application of transformational change and its role in addressing future uncertainties.

Photo: Axel Fassio (CIFOR)

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